DATA PROCESSING DIGEST

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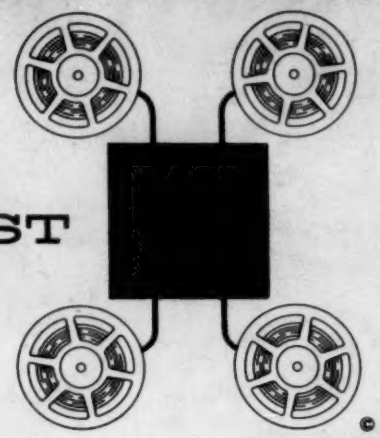

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Programing

TIME SHARING IN LARGE FAST COMPUTERS

C. Strachey, National Research Development Corp., London, England
COMPUTERS AND AUTOMATION, AUGUST 1959; pages 12-16.

A serious imbalance exists between the speed of electro-mechanical equipment used for input-output, and the speed of operation of the wholly electronic arithmetic and control circuits. The present solution is to have each unit wholly or partly autonomous with its own buffer storage. However, this is tremendously expensive. A solution would be the time-sharing of the central computer to control magnetic tape operations. However, the computer must be very fast--in the microsecond range--and the "borrowing" must be organized automatically whenever it is needed so that the programer need not be aware of it. A possible solution is given:

"The magnetic tape unit has two single word registers associated with it. One of these is a shifting register and is used to assemble a complete word from the characters as they come off the magnetic tape. When a word is complete it is transferred to the second register and an 'interrupt program' signal is sent to the central computer. This causes the computer to stop obeying the main program and enter a special sequence of orders to deal with the word from tape; at the same time it records the place where it left the main program. The special sequence of orders checks the parity of the word from magnetic tape, adds it to the sum check if necessary and stores it in the appropriate part of the main store. It then advances the count or index register. If the end of the block has not yet been reached, the computer then returns to the main program. At the end of the block the appropriate checking is done before returning to the main program."

This plan does not provide for lock-out during transfers, nor does it preclude the possibility of several "interrupt program" signals coming at the same time from different units or of one special sequence of orders being interrupted by another or by itself.

A way out of these difficulties is to "divide all possible interrupt signals into a small number of classes. The classes are allotted an order of priority, and any interrupt signal can only interrupt the pro-

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Interrupt signals are given priority ratings

gram immediately if this is of a lower priority class. If the program being executed is of the same or higher priority class, the interrupt signal is merely stored. At the end of a sequence of orders of one priority, the machine scans the waiting list and starts to operate on the call with the highest remaining priority."

For a relatively small increase in hardware, a considerably better system can be obtained. This system can be of benefit in using a computing system more efficiently in three areas: taking advantage of its speed, in program checking, and in the maintenance and adjustment of peripheral equipment. These last two consume great amounts of unproductive computer time.

When several variable programs are in the machine at the same time, new problems appear. The most important of these is the necessity of seeing that the programs do not interfere with each other. Interlocks must be provided, and it must be possible to change them by machine instruction when required. The other problems are concerned with the best method of program checking of this kind of a machine. A particular problem is the difficulty of knowing when a program under test is in error and has come to a loop stop.

"The Director" can control the entire program

A solution is a control program which the author calls the Director. It is a fixed program kept in a special storage location which is non-erasable. Connected with it is a working space which is controlled only by instructions in the Director. "The fact that the Director is in a special, fixed part of the store makes it possible to introduce machine instructions which are only accessible to the Director. If the instructions which alter the main store interlocks are of this sort, it is quite easy to arrange that no program can alter the interlocks of any other program, and thus to give protection against programs under test running wild." To demonstrate these suggestions, the article concludes with a description of a hypothetical machine incorporating the Director feature.

STEPS—A MANAGEMENT GAME FOR PROGRAMMING SUPERVISORS

Robert Boguslaw and Warren Pelton, System Development Corp., Santa Monica, California
DATAMATION, November-December, 1959; pages 13-16.

STEPS, the STAFF Training Exercise for Programming Supervisors, is a simulation game developed by System Development Corporation to provide training for production managers for firms which specialize in the manufacture of computer programs for large scale automation efforts.

STEPS presents a simulated work environment for supervisors or managers of a programing effort. Its goals are "to develop competence in recognizing the impact upon work flow of events which can affect production," and "to develop competence in decision-making programming production."

"Before any progress could be made, it was necessary to have some way of describing programs in relative terms; to provide a basis for estimating the time, number, and qualifications of people needed to get them written."

Rating table to describe program requirements

A set of seven rating scales was developed as follows:

1. Degree of Generalization
   a. Parameterized, but required reassembly to change parameters
   b. Parameterized, uses card input for changes
   c. Modularized, uses subroutines and a logical framework (fully parameterized)
   d. Uses executive-subroutine approach, semi-compiler technique
   e. Compiler type, uses a problem language, compiling-machine language
2. Complexity
   a. Simple input-compute-output or service
   b. Straightforward mathematical subroutine
   c. Multi-input, multi-output, straightforward processing
   d. Logically or mathematically complex, independent of other programs
   e. Logically or mathematically complex, system integrated, or simultaneous multi-input output
3. Size
   a. 0-200 instructions
   b. 200-500 instructions
   c. 500-1000 instructions
   d. 1000-4000 instructions
   e. Multiprograms of (d) size or greater than 4000 instructions
4. Level of formulation and planning
   a. Flow-diagrammed--detailed
   b. Formats and detailed functional description documented
   c. Program requirements documented
   d. System analysis complete, system requirements documented
   e. Statement of contract scope and responsibility
5. Dependency
   a. Self-contained, completely independent
   b. Subroutine, meets requirements for use in other programs
   c. Operates as one stage of a 2-4 stage process
   d. Operates within a utility system and as part of a complex program system
   e. Completely dependent on internal system organization and external environment
6. Uniqueness of techniques required
   a. Common, elementary, machine limited by computer language

b. Common machine language, limited problem oriented language.
c. Computer oriented language and full problem oriented language
d. Universal computer oriented language
e. Advanced developmental language

7. Efficiency requirement
   a. Low (One-shot usage)
   b. Medium (general program usage) no time or space limitations
   c. Medium (general program usage) with time or space restrictions
   d. High (subroutines, utility systems, and highly repetitive programs) no space—time restrictions
   e. High (subroutines, utility systems and highly repetitive programs) with space—time restrictions

Groups of three represent a programing project

The game problems are stated in terms of these seven scale points. The exercise is conducted with the participants divided into groups of three, each group representing one company's programing project. Each person in the group is a section head and is given a work assignment in the form of a memo. The section heads may confer with each other, but they each have to determine their personnel needs, requisition them from the personnel office and assign programing tasks. Additional memos come from the project office, computer room, assistant section head, etc., which introduce new difficulties that must be dealt with.

At the conclusion of a STEPS session, the trainees are given a report of their performance which includes the following:

1. Speed with which contract commitments were fulfilled.
2. Economy of operations.
3. Numbers of errors in completed programs.
4. Quality of work produced.

General Information

NABAC CONVENTION SUMMARY

Bank automation as discussed at the NABAC Convention in Boston last September appears in two banking publications, Auditgram, November 1959, and Banking, November 1959. The following digests, taken from Auditgram, are also covered in Banking.

MICR AND CHECK COLLECTION

James V. Vergari, Federal Reserve Bank of Philadelphia
AUDITGRAM, November 1959; pages 31-36.

Check collection processes must be speeded up to match the internal check handling speeds. One way to do this is to revoke the war-born Deferred Posting or Delayed Returns practice.

In the matter of check clearance, verification will be entirely performed by the electronic system, and may be the source of some problems. During the years when banks are changing over to electronics, banks will have original documents in various stages of completion at the time they enter the automated clearance process. Some will have the payor's electronic address on their face, imprinted in magnetic ink, others will have the address improperly printed or not at all. These should be separated before they enter the system, and some incentive should be found to encourage this. For example, fully qualified items might be accepted up to a very late hour, while non-qualified items would have an early cut-off. Another approach would be to penalize improper items by giving them longer deferments for reserve credit purposes. An extreme measure might be to treat such non-qualified and nonencoded items as noncash collection items.

What are the legal implications?

Legal problems will arise from differences between the amount as originally written on the check by the drawer and the encoded amount. Such errors may be undetected until the check is later examined by the drawer. Some of the potential legal questions are: Is encoding of the amount on a check a material alteration? If an incorrect amount is encoded, will this void the instrument? What are the rights of the drawer against a payor bank that has paid a check in an encoded amount greater than that for which it was originally drawn? Under these same facts, what would be the rights of the payor bank against presenting bank, prior collecting banks, and the bank that incorrectly encoded the amount? What about reverse situations where the amount encoded and paid is less than the original amount? What are the responsibilities of the payor bank and prior collecting banks when a wrongful dishonor of the erroneously encoded check itself or of a subsequently presented valid check of the same drawer results from the payment of an over-encoded check? What are the rights of a depositor whose account has been charged by an electronic device for a check he did not issue that was on his check form imprinted with his electronic account number and either stolen from him or counterfeited but bearing a forged signature?

Readers who are interested in the answers to these questions as well as other legal problems are referred to The Business Lawyer, July 1959, especially the article titled "Mechanized Check Collection," by John J. Clarke.

Proof balancing operations at the encoding bank should uncover erroneous encoding in time for adjustments to be made. Payor banks

using electronic check processing equipment might use spot-checking techniques on predetermined check amounts or other sampling principles at a late stage in the procedure for visual verification of encoded amounts and drawer signatures.

Banks which cannot afford automated bookkeeping equipment at the present time may ask why they should order magnetic ink checks and encode the dollar amounts on checks not drawn on their banks. The answer is that first, they should do it in the interest of a more efficient check collection system that will indirectly benefit them and their customers, and a public service. Second, they should do it so that their correspondent bank and/or Federal Reserve Bank may render a faster and more efficient collection service.

CUSTOMER ACCEPTANCE

Forde U. Steele, Central National Bank, Cleveland, Ohio
AUDITGRAM, November 1959; pages 10-16.

Some problems to be met in mechanized check handling are discussed as follows:

The customer's role. The mechanization of check handling can be only as successful as the input to the system, that is, the checks and the deposit slips initiated by the customer. Therefore, the customer must be educated to treat these pieces of paper as input documents and help reduce the number of rejects due to physical mutilation.

Choosing the system. The account numbering system selected by a bank must be compatible both for semi- and fully-automatic processing, and must provide for growth or mergers. The numbering system should be designed primarily for the sorting operation, rather than the posting operation, since the larger savings will be in check handling. There is evidence that no bank, regardless of its size, gains much advantage by using an alphanumeric system. Such systems are generally inefficient for a computer application because of the large gaps between numbers. Besides, these systems are not conducive to good customer relations. The numeric system, on the other hand, is more efficient in computer processing and on an MICR sorter, and provides more amply for future growth.

Alphanumerics is not efficient

Readable magnetic ink. Banks will have to see to it that customers use only checks which are imprinted by qualified printers, and that only acceptable items enter the check handling systems. It is suggested that groups of banks work together to qualify the check printers in their area and test samples of every order run by a printer. If banks act jointly they will have a much better chance of pushing the percentage of qualifying items near the 100% mark.

Banks which doubt their customers will use preprinted deposit slips 100% of the time are hoping for the development of window im-

printers such as the charge plate imprinting devices. However, to date, such devices are not sufficiently accurate to guarantee successful processing.

Who will pay. Who will pay for the additional cost of magnetic ink imprinting? Who pays for a redesign cost as the result of changing to magnetic ink checks? How does a bank avoid taking on more expense than is necessary? The 5% to 15% increase in the cost of magnetic ink checks should be borne by the bank, since the bank will be the primary beneficiary from automatic handling. For at least 90% of the bank's customers, there should be little redesign of checks necessary. However, for those who have specially designed checks, there may be some difficulty involved. For example, a window envelope check may be designed to fit in with the company's entire records control program. If the envelope window must be relocated to accommodate the magnetic printing at the bottom of the check, how many other forms which use this same envelope will be effected, and who must pay for the redesign of these forms?

Check redesign may affect other company forms

In the matter of counter checks, many customers who depend on these handy checks will be required to carry their check books with them, instead. Prequalified deposit slips will be a problem, also, and one solution would be to include these with the customer's check book. The development of a plastic or metal plate for use with an imprinter might solve this problem.

Handling noncoded items. Internal bank papers used in processing customer business will also have to be encoded with account numbers and amounts on manual encoders. To be handled by the sorters, these papers must be printed on 24-pound stock. Those which cannot be placed on this weight stock will have to be reproduced on substitute documents for processing, either by using a magnetic ink encoder or on punched cards using the keypunch. Other noncoded items, such as counter checks and nonprequalified checks and deposit tickets will have to be treated in a similar manner. The cost of special handling of such items must be accurately gauged and taken into account when a bank is determining the possible profit or loss of an MICR handling system.

Internal bank documents must be encoded, too

SOLVING THE INPUT PROBLEM—FIRST STEP IN MICR

Leonard M. Selden, Michigan National Bank, Lansing, Michigan
BURROUGHS CLEARING HOUSE, November 1959; pages 38, 39, 104, 105.

The Michigan National Bank began to prepare for MICR as soon as the ABA specifications were announced. They found that controlled accounts (those accounts which used bank-issued checks) offered little difficulty in the changeover, therefore the major portion of their customer effort was devoted to non-controlled accounts, in which the company account had specific check requirements to be resolved before the MICR checks could be installed. Each of the non-controlled accounts was sent a letter of explanation and a questionnaire asking such questions

Systematic plan for helping customers redesign checks

as the number of checks written annually, the inventory of the customer's present supply, his re-order date, the name of his check supplier, and the type of accounting machines used. He was also asked to submit samples of each check form, related accounting documents, and window envelopes if used. Problem areas were uncovered as the bank began compiling the information from the returned questionnaires.

Each check supplier mentioned in the questionnaires was contacted to find out when and if he planned to print magnetic ink checks. The bank offered its assistance to them. As each customer's reply was processed, the re-order date was noted, the check was analyzed for necessary design changes, and a file was established for the customer. Using the re-order date as a schedule, the customers were called on and advised on ways in which the bank could help them make the changeover. Customers using punched card checks were contacted as soon as possible so that check redesign could begin immediately, since it involved changes in tab programing to provide for the ABA reserved columns.

In MICR check design, four problem areas must be considered: size of check, check areas which cannot be changed because of customer requirements, placement of the signature line, and the aesthetic design of the check. An illustration of the redesign of a check to meet the MICR standards, and an illustration of the letter and questionnaire sent to the non-controlled accounts is included in the article.

ALPHA DIGIT POSTING

UNITED STATES INVESTOR, November 2, 1959; pages 24, 25.

Alpha-digit posting ((see DPD: April 1959, page 12 and August 1959, page 10)) has been installed by a number of banks of various sizes throughout the country. One of these, The Marine Trust Company of Buffalo, New York, is the largest bank in the State of New York, outside New York City. This bank has found that it can gain the advantage of faster posting through elimination of the proving run, without the need for account numbering. No special training was required for the operators. They merely pasted a copy of the alpha-digit rules on their posting machines. Very few errors were made, and these disappeared in the first two or three months. The operators have plenty of time to index the next account while the machine is working on the account just posted.

Alpha-digit posting is based on rules for coding an account according to the terminal (last) letters of the account name. The three rows of keys on the comparator keyboard of the posting machines are lettered instead of numbered. Eleven rules for coding account names are included in the article.

REPORTING COMPUTER PERFORMANCE TO MANAGEMENT

J. A. Campise, The Hughes Tool Company, Houston, Texas
JOURNAL OF MACHINE ACCOUNTING, November 1959; pages 12-15.

It is the responsibility of the managers of electronic data processing installations to keep management informed of the costs involved. They must also realize that management needs assistance in analyzing these costs. The two basic questions here are: 1) how well are we using our machines? and 2) how well are the machines performing mechanically? Fortunately, the same basic data may be gathered to suit this purpose and to monitor the operation of the computer system to keep it properly directed.

Log is source for management reports on computer operation

This source is the daily log which is filled out for each job each day in the computing center. The log contains the following information: date and day of week, job number, read and punch feeds used, job name and remarks, time in and time out, elapsed time in minutes, operator, time code (productive run, program testing, scheduled maintenance, unscheduled maintenance, lost time due to machine failure, lost time due to operator error, other--explanation necessary).

The two basic criteria for judgment of machine usefulness are rental cost per productive hour, and the ratio of up-time hours to down-time hours. Rental cost per productive hour is computed by adding productive processing time to debugging time, and dividing by the monthly rental cost. The ratio of up-time hours to down-time hours tells how many hours of good running time the company gets for each hour of down-time.

Management receives a plot of rental cost per productive hour vs month and a plot of performance factor vs month. There is also a plot made showing total down-time, total re-run time, total productive time, total utilized time, and total non-utilized time.

Two charts included in the article give some interesting statistics on computer performance. For example, rental cost of the 650 per productive hour ranged from $44.45 to $62.48 over a five-month period. The ratio of up-time hours to down-time hours varies from 2.8 (2.8 hours good time to one hour of down time) to 15.3 over this same five-month period.

BUSINESS-TYPE PROBLEMS FROM A COMPUTER STANDPOINT

Dr. Paul Brock, Hughes Aircraft, Culver City, California
COMPUTERS AND AUTOMATION, August, 1959; pages 18-22.

Business operations performed by computers may be classified according to the analytical problem the computer must perform. These are five in number.

Single file problems. These are characterized by the existence of a single file of information that must be used in the solution of the problem. The operations that are performed are: query--unit record information used as a basis for performing subsequent operations; checking--in operation by exception, the information in a unit record is checked to determine whether any special operation has to be performed for that record; up-dating--the unit record must be changed to include most recent information; stretching--additional unit records are inserted into the file; deletion--unit records of a file become obsolete.

Subsidiary operations. Operations which may be performed to satisfy the requirements of problem, but which are subsidiary to the file operations are: pre-sorting, arithmetic computation, checking, input-output.

Trust accounting is a multi-file application

Multifile problems. These problems are characterized by the existence of two or more files with a necessity for cross-referencing during problem solution. Examples are customer accounting and trust accounting. In both of these, a pre-sort on one file is not sufficient. For example, in trust accounting there must be a file of accounts and a file of the securities. The standard action on the trust files normally involves an adjustment of the individual trust portfolio. This must be reflected in the security file. If the bank decides to make an adjustment of its own security portfolio, this must be reflected and adjusted as it affects the individual trusts. Either an intermediary random access to the security file or internal sorting procedures are necessary. This kind of a problem requires a very fast computer or one which does the sorting as a buffered operation.

Management statistics. This kind of a problem is well suited to a general purpose computer. It is characterized by large amounts of data processing with small output.

Exception report results from statistical data processing

Management by exception. The above type of computing problem leads to the principle of management by exception, wherein the traditional "Report of Operations" is supplanted by an "Exception Report," compiled by the computer from statistics and management-approved parameters. Some advantages of this type of reporting are: less expensive and more accurate, eliminates wasted time of checking normal operation, reduces delay time of corrective action for company difficulties, all exceptions are reported, none are missed, and it allows for company expansion that normally would be difficult because of paperwork loads.

Mathematically complex problems. These are not commonplace problems in businesses, but do occur in pipe line and similar companies.

SELECTION OF COMPUTER PERSONNEL

R. M. Paine
THE COMPUTER BULLETIN, August-September, 1959; pages 23-26.

Selection of computer personnel in Britain follows lines similar to those in U. S. A. This discussion covers five broad (and sometimes overlapping) classifications: systems analysts, programers, operators, data preparation staff, and maintenance engineers. The total staff required for a large computer system with magnetic tape is estimated between 50 and 75.

Systems analysts play the major part during the survey period, in the choice of equipment, and during the planning of the overall data processing procedures. Organization and Methods personnel are often selected for this work. The system analyst must be skilled in problem recognition and in sensing the inter-relation of the activities of a firm. He should also be familiar with accountancy and programing.

Programers should flow chart, code, and test

The programing staff is composed of persons who will work in cooperation with the systems men to plan and flow chart the new system. The author does not think it advisable to break the programing function into senior programers and coders, but believes the total concept of specification, flow charting, coding, and testing should be handled by one person.

Patience and curiosity about how patterns fit together is more important than very high intellect, and a knowledge of office methods and terminology is essential. Aptitude for programing apparently is not directly related to advanced education. Selection is best made by combining several of four approaches: aptitude tests, performance on a training course, past history and experience, and interviews. A discussion of aptitude tests includes some experiences of System Development Corporation and the Rand Corporation in finding and testing programing personnel. Programers' salaries in Britain range between £700 and £1500 (($1960 - $4200)).

Operators must be trained before the computer is installed. These persons tend to specialize in the various duties such as operation of the console, feeding and removing magnetic tape, attending the printer, overseeing the card and tape files. The console operator needs some knowledge of programing and must use judgment about when and when not to call on the engineers for their assistance. Other operators need manipulative skill and tidy methods. Women perform this work well, and recruiting is not presently difficult.

Large staff of girls is needed for data preparation

Data preparation staff is the largest complement of personnel in an installation at the present. This may decrease as more automatic means of recording and input are devised. This function is largely the punching and verification of cards and paper tape or preparation of magnetic tape. The staffing is usually all girls, and there is a large turnover. The work is dull but demands concentration. Good supervi-

sion is required. In some companies which have both tabulating and computing departments, the better keypunch operators are used in the computer installation, thus forming some ladder of promotion.

Maintenance engineers are most often provided on contract or under a rental agreement by the computer manufacturer. They are recruited from graduate engineers or trained technicians, and receive further training in computer logic and equipment by the manufacturer.

NOMA SURVEY

OFFICE EXECUTIVE, October 1959; pages 10-15.

The second annual survey made by the National Office Management Association of EDP installations is reported in this issue. Replies were received from 369 NOMA member companies that have installed EDP or IDP systems.

The medium EDP system was the most popular, with 184 installations, followed by the small systems with 65 installations, and the large systems with 47 installations. IDP installations accounted for more than 23 per cent of the total.

The largest number of medium size machines was assigned to insurance companies, with 41 installations. Light machinery and manufacturing, public utilities, and electrical manufacturers accounted for the major portion of the other medium size installations.

Small computers were found mostly in insurance, food, tobacco, and drug categories. The insurance companies were also on top with the large systems, claiming 13 of them. Banking and heavy machinery followed with six each. Only two large IDP installations were reported, both in the chemical industry. Seventeen companies reported having more than one type of installation, such as an IDP system along with a medium EDP system. The largest number of installations was found in offices that had more than 101 employees but less than 250.

AUTOMATION BIBLIOGRAPHY

OFFICE EXECUTIVE, October 1959; pages 25-31.

The NOMA Automation Bibliography is presented in this issue. It is a selection of articles, books, and reports which are contained in the NOMA library at Willow Grove, Pennsylvania. The items have been published during the period July 1954 to August 1959. While this is not a complete listing, and there are several obvious omissions, it is a list which will be helpful to the executive who needs a good source of information on material published during this important six-year period.

Equipment

AMERICAN AIRLINES NEW SABRE RESERVATION SYSTEM

American Airlines will have a new reservations system in operation late in 1961. The system, designated IBM 9090 by the manufacturer is known by the code name SABRE. It is said to be the largest electronic processing system ever designed for business use. The system will handle more than 7500 complete airline reservations per hour. The computing center will be in New York and will be linked with all other cities served by American Airlines by leased telephone wires. Most of these cities will be linked to the center by the end of 1962.

Some of the benefits of the new system are: more airline seats available to the customer through SABRE's first-come, first-served basis; special arrangements for passengers, such as request for car rental; automatic reminder of agents to advise passengers of changes affecting them, or to pick up tickets within the time limit; maintaining waiting lists for space on fully-booked flights; automatic fare quotations and arrival and departure information.

Requests for information are handled in a manner similar to the present system, in which the reservations clerk inserts a coded flight card into the agent set and enters time and date on keys. The large disk memory at the computing center searches for the requested information and flashes it back to the agents set. ((From a news release.))

WHAT'S DIFFERENT ABOUT THE NEW COMPUTERS

ELECTRONICS, November 20, 1959; pages 36, 37.

The new computers are the result of many small advances in electronics, such as transistors and other solid-state devices, new circuit techniques, tape units which can handle records of varying lengths, buffers as an integral part of the main memory, separation of computing and control functions, automatic error correction, and many others. Thin magnetic films and cryogenic devices will bring about more changes in the future. A rundown of the new computers is given with the characteristics which have resulted from the advances mentioned above.

Applications

RCA 501 AT AIR RESERVE RECORD CENTER

The U. S. Air Force is using an RCA 501 to process and maintain records on more than 535,000 reservists at the Air Reserve Record Center in Denver. It will be used to identify reservists who have the necessary skill and training for assignment to mobilization positions. To obtain this information, surveys are sent to reservists at periodic intervals. The system will identify individuals who are to receive surveys, address the survey forms, and control surveys, including any necessary follow-up in the mailing procedure. The Air Force will also use the system's memory to pull a list of officers eligible for promotion, and the system will be used in the addressing of labels to mail 330,000 copies of the Air Reservist Magazine monthly and 20,000 quarterly copies of the Medical Reservist Bulletin. ((From a news release.))

SUMMARY OF DATA PROCESSING APPLICATIONS

PUNCHED CARD DATA PROCESSING, September-October 1959; pages 28-30.

Charts showing the result of a survey by this publication indicate that payroll is still the favorite application for electronic computers as well as punched card equipment, followed closely by inventory control and billing. Improved accuracy was the reason most often given for installing an electronic or tab system. Manufacturers of durable goods were the most prolific users, followed by insurance or finance organizations and manufacturers of non-durable goods.

PUNCHED CARDS LIFT PROXY VOTE 5 PER CENT

CREDIT AND FINANCIAL MANAGEMENT, November 1959; pages 22, 23.

The Southern Railway is using its IBM 705 computing system to process stockholders records and issue proxies. The more efficient system enables the railroad to follow up holders of 100 or more shares who have not submitted signed proxies, rather than limit follow-up to holders of 500 or more shares as formerly. This has resulted in an increase of 5% voting response. Furthermore, the time for processing proxies has been cut from weeks to hours.

Meetings

National Symposium on Machine Translation, sponsored by University of California (Berkeley and Los Angeles), University of Southern California, and University of Washington

Date: February 2-5, 1960
Place: University of California at Los Angeles
Content: Current research, Methodology, Grammatical Studies, Syntax, Dictionary, Information processing and linguistic analysis, Semantic resolution, Programing and super-programing for mechanical translation, Design of equipment for information processing.
For: Professionals active in Machine Translation, Linguists, Language scholars. Of interest to: Computer scientists, Information retrieval specialists, Librarians, Documentalists, Manufacturers of data processing equipment.
Fee: None
Information: Engineering Extension, Room 6266, Eng. Bldg. II, University of California, Los Angeles 24, California, or TWX: West Los Angeles 6705

Second Retail Research Institute EDP Conference, sponsored by and for NRMA members.

Date: February 8-12, 1960
Place: San Francisco, California (St. Francis Hotel)
Fee: $100 (includes four luncheons)
Content: Automation in the retail industry, with additional information about EDP in banking, insurance, and aviation.
Information: Miss Ethel Langtry, Research Director, Retail Research Institute, NRMA, 100 W. 31st Street, New York 1, New York

SHARE XIV Meeting

Date: February 15-19, 1960
Place: Statler Hilton Hotel, Los Angeles, California
Information: Jerry Koory, System Development Corp., Santa Monica, Calif.

Univac Users Association

Date: February 25, 26, 1960
Place: White Sulphur Springs, W. Va. (Greenbrier Hotel)

AMA Sixth Annual Data Processing Conference

Date: February 29 - March 2, 1960
Place: New York City (Statler-Hilton Hotel)
Information: American Management Association, Inc., 1515 Broadway, Times Square, New York 36, New York

IRE National Convention

Date: March 21-24, 1960
Place: Coliseum and Waldorf Astoria Hotel, New York, New York

Western Joint Computer Conference
Date: May 2-6, 1960
Place: San Francisco, California

Insurance Accounting and Statistical Association Annual Conference and Business Show
Date: May 15-18, 1960
Place: Chicago, Illinois (Sherman Hotel)

Conference on Automatic Computing and Data Processing in Australia, sponsored by the Australian National Committee on Computation and Automatic Control
Date: May 24-27, 1960
Place: University of Sydney and University of New South Wales
C. H. D. Harper, Secretary, Australian National Committee on Computation and Automatic Control, c/o The Institution of Engineers, Science House, 157 Gloucester Street, Sydney, Australia

National ACM Conference
Date: August 23-25, 1960
Place: Marquette University, Milwaukee, Wisconsin

Share XV Meeting
Date: September 12-16, 1960
Place: Pittsburgh, Pa. (Pittsburgh Hilton Hotel)
Information: E. B. Weinberger, Gulf Research & Development Co., Drawer 2038, Pittsburgh 30, Pa.

Training

Engineering Executive Program
Date: September 1960 (Deadline for applications, March 1, 1960)
Place: University of California at Los Angeles
Program: Master's Degree program for engineers who will fill top executive positions in industry. The program will stress the evaluation function and the decision making function of the executive.
Fee: $350.00 for each semester
Information: Engineering, Room 4073C Engineering Building, Unit I; University of California, Los Angeles 24, California

References

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